



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,192	02/13/2004	Takenobu Kobayashi	00684.003585	7532

5514 7590 07/23/2008
FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

DALEY, CLIFTON G

ART UNIT	PAPER NUMBER
----------	--------------

2624

MAIL DATE	DELIVERY MODE
-----------	---------------

07/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/777,192	Applicant(s) KOBAYASHI ET AL.	
	Examiner CLIFTON G. DALEY	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/11/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10-13 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-13 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/11/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This action is Final. Claims 1, 2, 4-8, 10-13 and 15 are currently pending. Applicant's response received on 3/11/2008 is fully considered herein and is not persuasive.

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: STEP 210 (Fig. 8B) . Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2624

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4, 6-8, 10, 12, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (Hereinafter "Yamada": US6081614) in view of Os et al. (hereinafter "Os": US Patent Application 2002/0054715 A1) and further in view of David (US 6068954).

Regarding claims 1 and 7, Yamada teaches a method and analogous apparatus of measuring a position of a surface of an object while the object is scanned relative to a detection unit in a scanning direction in an X-Y plane, the detection unit being configured to detect the position of the surface in a Z direction perpendicular to the X-Y plane **(column 7, lines 12-16, i.e. X-Y)**.

Yamada does not teach said method comprising:

a detecting step of scanning the object relative to the detection unit in two scanning directions opposite to each other, and detecting, with respect to each of the two scanning directions, a position of the surface for the same detection point on the surface.

Os discloses a scanning system comprising a detecting step of scanning the object relative to the detection unit in two scanning directions opposite to each other, and detecting, with respect to each of the two scanning directions, a position of the surface for the same detection point on the surface **(page 2, paragraph [0016], lines 1-6)**.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Os' bi-directional scanning method with Yamada's teaching, the motivation being to increase throughput and reduce component cycle wear (**Os: page 2, paragraph [0012]**).

Yamada in combination with Os teaches a calculating step of calculating a correction value for correcting a position of the surface to be detected by the detection unit, based on the positions of the surface detected with respect to the two scanning directions in said detecting step (**Yamada: column 8, lines 22-40**)

Yamada in combination with Os does not teach the limitation of a second measuring step for measuring a surface position of a second object while relatively scanning the detecting unit and the second object in any one of the plurality of directions; and a correcting step for correcting the surface position of the second object obtained by said second measuring step, on the basis of the corrective amount obtained by said calculating step.

However, David discloses a surface position measurement method comprising a second measuring step and correcting step for a second object (**column 7, lines 1-1-3, i.e. multiple wafers per lot**).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine David's method with the Yamada/Os teaching, the motivation being to increase throughput.

Regarding claims 2 and 8, Yamada in combination with Os and David teaches a method and analogous apparatus according to claim 1, wherein the object is a semiconductor wafer **(Yamada: column 1, lines 7-19)**.

Regarding claims 4 and 10, Yamada in combination with Os and David teaches a method and analogous apparatus according to claim 1, wherein said detecting step detects the position of the surface with respect to each of a plurality of sample shot regions on the surface **(Yamada: column 8, lines 23-30)**.

Regarding claims 6 and 12, Yamada in combination with Os and David teaches a method and analogous apparatus according to claim 4, wherein, in said calculating step, data of the position of the surface to be used for calculation of the correction value is chosen based on difference between the positions of the surface detected for the same point with respect to the two scanning directions in said detecting step **(Yamada: column 12, lines 17-22)**.

Regarding claim 13, Yamada in combination with Os and David teaches an exposure apparatus for scanning an object in a scanning direction in an X-Y plane, measuring a position of a surface of the object, which is scanning, in a Z direction perpendicular to the X-Y plane, moving the object, which is scanning, in the Z direction based on the measured position, and exposing the object, which is scanning and moving, to a pattern, said apparatus comprising:

a measuring apparatus, according to claim 7, for measuring the position of the surface of the object **(Fig. 1)**.

Regarding claim 15, Yamada in combination with Os and David teaches a device manufacturing method, including a step of exposing an object to a pattern by use of an exposure apparatus as recited in claim 13 (**Fig. 5**).

4. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in combination with Os and David as applied to claim 1 above, and further in view of Kataoka et al. (Hereinafter "Kataoka": US 5751428).

Regarding claims 5 and 11, Yamada in combination with Os and David teaches a method according to claim 1.

Yamada in combination with Os and David does not teach the limitation wherein, in said calculating step, the positions of the surface detected in said first detecting step with respect to the two scanning directions are weight averaged, and the correction value is calculated based on the weighted average.

However, Kataoka discloses a calculating step wherein the positions of the surface detected in said first detecting step with respect to the two scanning directions are weight averaged, and the correction value is calculated based on the weighted average (**column 9, lines 19-25**).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Kataoka's calculating step with the Yamada/Os/David teaching, the motivation being to provide good estimates of position when more than one measurement are available.

Summary of Applicant's Remarks: The prior art of record does not teach "a detecting step of scanning the object relative to the detection unit in two scanning directions opposite to each other, and detecting, with respect to each of the two scanning directions, a position of the surface for the same detection point on the surface", as recited in independent claims 1 and 7.

Examiner's Response: The lack of limitation introduced by the bi-directional scanning step has been resolved in the new 103(a) rejection presented above. The examiner notes that "a position of the surface" is interpreted as an X-Y position, as taught by Os, and "the detection unit being configured to detect the position of the surface in a Z direction" is interpreted as meaning the detection unit is configured in the Z direction, as taught by Yamada.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLIFTON G. DALEY whose telephone number is 571-270-3144. The examiner can normally be reached on Monday - Friday 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Samir Ahmed
Examiner
Art Unit 2624

Application/Control Number: 10/777,192
Art Unit: 2624

Page 9

CGD
7/21/2008

/Samir A. Ahmed/
Supervisory Patent Examiner, Art Unit 2624